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Plague Mortality and Demographic Depression in Later Medieval England[1]

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Both direct and indirect evidence implies that England experienced a lengthy period of stagnant or declining population during the later fourteenth and fifteenth centuries. The Black Death of 1348–1349 had brought about profound changes in England's agrarian economy, and this subsequent demographic depression is most commonly interpreted by historians as the result of plague mortality, recurring in severe outbreaks after the disease's introduction into the country. This paper reviews the evidence and assumptions behind this interpretation, in light of recent research by historical demographers and epidemiologists into bubonic plague epidemics and general mortality crises during the post-medieval period.

In recent years historians and historical demographers have made considerable progress in defining patterns of population and mortality in early-modern Europe. For England, through close analysis of such sources as parish registers and the London Bills of Mortality, severe and recurrent short-term fluctuations in mortality rates resulting from epidemic disease and occasionally harvest failure have become recognized as ubiquitous experiences in preindustrial communities. Moreover, appreciation is growing of the implications of these mortality crises for more general social and economic structures [1,2].

Because of the extreme levels of mortality which it could generate and the fear in which it was held by contemporaries, plague has come to be of particular interest to historical demographers, and a number of recent studies have specifically addressed historical plague epidemics. In some cases the sources have allowed fair statistical sophistication, and have established relatively clear patterns for specific features of local plague outbreaks [3–5].

But for anyone interested in medieval England the situation is less satisfactory. On the one hand, for many years medieval historians have placed long-term demographic movements and balances between population and land resources among the most crucial factors in English economic development between 1200 and 1500. And in most current interpretations of later-medieval population movements, the Black Death of 1348–1349 and subsequent plague epidemics of the later fourteenth and fifteenth centuries occupy a central place. On the other hand, medieval historians have been slow to apply to the middle ages the findings of historical demographers concerned with later periods of history, and many aspects of these current interpretations may be questioned on demographic or epidemiological grounds. A major

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difficulty is the nature of the medieval documentary sources, which preclude both the close local analysis and the regional or national perspective possible for later periods. The following discussion will not attempt to go very far into the methodological complexities of the problem, but instead will examine the current explanations, point to a few of their conceptual weaknesses, and briefly suggest an alternative theoretical model and the areas of future research which might support or refute it.

At the risk of oversimplification, the broad outlines of population movements and economic change in England during the later middle ages on which there is general agreement can be sketched very briefly.[2] At some point near the beginning of the fourteenth century, after a long period of sustained demographic and economic expansion, an anomalous phase was reached in which population may have levelled off or even begun to decline, depending on locality and circumstances. In the second decade of the fourteenth century, three consecutive years of harvest failure resulted in widespread and well-documented famine mortality. Whether these circumstances can be regarded as symptomatic of absolute overpopulation along Malthusian lines has been disputed, but this phase is usually interpreted as the aftermath of expansion by a still overwhelmingly agrarian society toward limits imposed upon it by existing resources and technology.

Then in 1348 the Black Death, a plague epidemic of massive dimensions, reached England after a rapid extension through most of western Europe[10]. In England the national death toll over the subsequent two years or so is usually estimated at between twenty-five and forty percent of the entire population. A fairly large body of contemporary narrative accounts of the Black Death has survived, but relatively firm data for death rates have been derived largely from other sources which are locally or regionally based, most commonly lists of deaths of tenants holding land in a particular locality or lists of institutions to parish benefices vacated by the deaths of their incumbents in a particular diocese. It is clear from these sources that mortality rates varied widely from place to place in a seemingly random manner, as some places appear to have escaped relatively lightly while others experienced losses greater than fifty percent, and so even with an accumulation of local case studies it is very difficult to extrapolate to a national average. At several other points in the later fourteenth century, notably in 1361, 1369, and 1375, narrative sources again mention apparently large-scale epidemics, and such references continued to be made throughout the fifteenth century and indeed beyond. The quality of information available for these later epidemics is much less straightforward than for the Black Death itself and will be discussed later in this paper. Nevertheless, historians have usually regarded at least the three major epidemics of the later fourteenth century, and some of the fifteenth century as well, as having been of national or near-national dimensions, though with rather lower mortality than the Black Death.

Because of the scarcity of direct evidence for national population trends throughout the middle ages, historians have been forced to infer the trends to a certain extent from indirect economic indicators, and in fact the broad outlines of demographic change under discussion here were first proposed on the basis of evidence of this kind from estate and financial documents. For the earlier period of growth, the indicators were an expansion of the area of land under cultivation, rises in real rents and in prices of agricultural commodities, and a proliferation of smallholders or near-landless persons at the bottom levels of rural society in many different regions of

[2]The classic statement of this outline is by M.M. Postan [6], although other writers have qualified or expanded upon various parts of the argument [7,8]. A recent synthesis, incorporating essentially the same themes, has been written by J.L. Bolton [9].

England. Conversely, after the violent depopulation of the Black Death the indicators all imply that national population continued to decline, or at most to stagnate at low levels, until the middle of the fifteenth century or later, and showed clear signs of a new expansion only near the end of the century [11]. Rents declined and land fell out of cultivation or was converted to pastoral uses, while coercive or non-economic sanctions to retain tenants which landlords had previously possessed were decaying. Although the importance of wage labor in the agrarian economy during this period is problematical, real wage rates escalated in the later fourteenth century to unprecedented levels, provoking novel attempts to legislate wage ceilings. The conclusions which can be drawn from such indirect evidence are clearly limited, but the few sets of data directly relating to annual changes in resident totals which have been discovered for local communities have broadly confirmed the outline of slowing expansion, dramatic reduction, and prolonged depression of the medieval population.[3]

But England's later-medieval demographic depression presents a real paradox in terms of the preconceptions of economic and reproductive behavior which medieval historians have conventionally applied to the problem. In contrast to the preceding interval of relative land hunger the century after the Black Death should have been extremely favorable for peasant economic conditions. The crude national ratio of land to people had been raised and the terms on which land was available to the peasantry had become easier, while returns were clearly greater for the segment of the population engaged in wage labor. Under conventional expectations on the part of medieval historians, easier accessibility of land should have facilitated the economic establishment of new peasant households, and so lowered marriage ages and raised the married proportion of the population. As a result of this, and conceivably also of higher real living standards in general, fertility rates should also have risen. In short, the conditions of the post-Black Death economy ought to have conspired to make possible a prompt and sustained demographic recovery, and in the absence of any evidence for such a recovery explanations have usually rested on population decline driven by plague mortality: having been established in a regional pool of infection in western Europe (which persisted until the later 1600s), endemic plague became the overwhelmingly dominant factor in the English mortality experience during the fifteenth century, and "natural" tendencies for a renewed demographic expansion were constantly checked by recurrent local or supralocal outbreaks. This particular kind of demographic logic is a long-established view among historians and is consonant with the generally gloomy picture presented by many aspects of the English economy in the same period. One historian called the fifteenth century the "golden age of bacteria," another termed the process a "continual sapping of the human resources of England," and a more recent writer has asserted that "mortality and not fertility was the demographic pacesetter[14–16]".

No clear measure of these numerous later-medieval plagues' cumulative impact on a national scale is likely to be forthcoming from the evidence presently available. In order to consider the plausibility of this role as prime mover which has been claimed for plague during the period, it is all the more necessary to formulate a more coherent model for the epidemic processes at work than medieval historians have offered. Despite differences in circumstances, parallels with other, better-documented epidemics which have been studied by historical demographers and epidemiologists are useful for postulating the most likely forms that medieval plague mortality took. This is particularly important for the mechanisms involved in propagating the Black

[3]Only two series of such data are now in print [12,13], but I hope to publish several more in the near future.

Death itself, the initial importation of the bacillus into England, because this process had major implications for the subsequent history of English plague mortality.

Plague has two major clinical variants, which are very different. These are bubonic plague, in which the bacillus is transmitted by a fairly complicated vector process from what may be called its "natural" pool, continuing cycles of infection or enzootics among indigenous rodent populations, and pneumonic plague, in which a clinical bubonic case develops secondary pneumonic complications which then allow the bacillus to be transmitted by direct droplet infection among humans without vectors. The bubonic variant has historically been responsible for the bulk of plague mortality in western Europe, but there are strong indications that the Black Death had a large pneumonic content. While most contemporary narrative accounts confined themselves to emphasizing the magnitude of the calamity, observers in several countries wrote responsible clinical descriptions of victims' symptoms [17]. The most striking of these was written by Guy de Chauliac, papal physician at Avignon in 1348, whose account includes accurate descriptions of both pneumonic and bubonic plague [18]. The Black Death's rapid geographical spread through Europe and its immense levels of mortality also appear more compatible with pneumonic plague's extremely high infectivity and case-fatality rates, although it is difficult to predict the consequences of invasion by a disease for a population lacking previous exposure to it.

Modern scientific observation of very large-scale pneumonic plague epidemics is limited to the Manchurian outbreaks of the early twentieth century, and the analogy which can be drawn with these epidemics suggests an important consequence of a predominantly pneumonic Black Death. In the Manchurian cases, once the pneumonic process had begun, epidemic propagation was rapid and mortality was very severe. But subsequent tests showed that large geographical areas had experienced heavy pneumonic plague mortality without any involvement of the indigenous rodent population; that is, given the right conditions a pneumonic epidemic could be self-sustaining on a national scale [19]. These examples indicate that the widespread geographical distribution of mortality in England during the Black Death did not necessarily entail the establishment of enduring foci of the bacillus in enzootic form on an equally widespread basis.

Plague almost certainly was first imported into England in vector form. And there is no reason to doubt that enzootic plague was present in the country until the end of the middle ages and beyond, despite one medical historian's recent claims that the bacillus' vector networks would have been unlikely to survive England's winter climate and so fresh importations of the disease would be necessary for successive epidemics [20]. But historians' conceptualization of enzootic plague's establishment in England in the fourteenth and fifteenth centuries needs to be refined, because there is a great difference between the simple existence within the country of enduring bacillus reservoirs and such a heavy and abrupt saturation of the countryside with enzootic plague that long-term national mortality levels were consequently raised enough to depress population. Such a conceptualization obviously must be compatible with the medieval evidence. It is worth asking, though, whether the situation depicted in this evidence is necessarily incompatible with the relatively clearly understood pattern of plague incidence which has been traced for a slightly later but much more fully documented period of English history.

In England during the sixteenth century, enzootic plague was concentrated in major towns, preeminently London, and plague vectors which invaded smaller communities and rural areas had frequently been transported from these foci. The

local bubonic plague epidemics which resulted outside the larger towns appear frequent, sporadic, and randomly distributed from a national standpoint, and there probably was no decade which did not witness serious outbreaks somewhere in the country. In any given locality, however, even the most severe epidemics tended to be rapid and extremely localized, while the geographical spread of the disease from place to place was usually slow. Aggregated national or regional mortality rates therefore masked much more volatile swings in local rates (due to less lethal diseases as well as plague), and English plague mortality was felt as an accumulation of localized crises rather than as synchronized elevations of mortality rates over larger areas, although there were a few occasions on which more widespread crises did occur during the sixteenth century. London, however, and perhaps also some provincial towns, experienced moderate levels of plague mortality on an almost annual basis as well as the better-known major epidemics [1].

In contrast, the nature of plague's incidence during the later fourteenth and fifteenth centuries is much more obscure because relatively firm statistical evidence from particular localities and relating to the bulk of the population below the aristocracy is extremely scarce. Most epidemics in this period are still known chiefly from references in chronicles or other narrative sources, and incidental details in legal, governmental, or ecclesiastical documents. These references indicate very frequent epidemics in England, and such local evidence of a more quantitative nature as exists sometimes indicates simultaneous crises in particular towns or villages, and other crises which were not thus synchronized [21]. Unfortunately, the nature of this evidence frustrates any firm conclusions about each epidemic's severity or geographical dimensions. It is particularly difficult to know the extent in geographical or social terms of most chroniclers' information or observations, as this literary genre had deteriorated in quality from a slightly earlier period when there had been a strong tradition of writers with informed national perspectives [22]. Thus when a crisis is recorded, even with an implication that it was widespread, it might remain uncertain how localized a phenomenon it may actually have been. The importance of diseases other than plague in this period is also unclear, as the term *pestilentia* was sometimes applied by contemporaries to epidemic disease in general, although fuller descriptions are given in some cases. Despite these difficulties, most medieval historians have been willing to consider as "national" epidemics many of the crises known for the fifteenth century, especially when independent information has been found for enhanced mortality in more than one place at the same time. A recent summary of the subjects listed fifteen national or extra-regional epidemics between 1379 and 1485 [21]. Moreover, the term "endemic" is often used by historians who assume that plague mortality formed a continuous component of "background" mortality throughout much of the country in addition to the sporadic crises of larger scale, as was London's experience in the next century, although most of the medieval sources furnishing quantitative information are sensitive only to *changes* in numbers of deaths rather than derivable absolute rates.

It is obvious from this summary that the epidemic processes postulated by medieval historians from fifteenth-century evidence are very different from the incidence patterns which plague exhibited in the fuller documentation of the sixteenth century. Accordingly, some medieval historians who have asserted plague mortality's supremacy in England's fifteenth-century demography have also argued that the disease underwent a change at some point toward the end of the century, from a generalized to a localized phenomenon largely restricted to towns, and from an "endemic" to a more exclusively epidemic incidence, with an effective lessening of

national mortality levels [16,21]. This is usually envisaged as an autonomous mutation on the part of the disease, as it would be difficult to maintain that any fundamental changes took place in such environmental factors likely to affect vector propagation as urban/rural settlement densities, transport or communication networks, or public health measures. An autonomous change of this sort, involving either bacillus mutation or changes in human or rodent susceptibility, may not be inherently impossible, though this argument appears to emphasize to a misleading degree the urban nature of early-modern plague mortality.

But it is equally possible possible to argue from the fifteenth-century evidence that plague's behavior in that century was not substantially different from Tudor England's experience. On this analogy, bubonic plague epidemics of comprehensively "national" incidence would have been unlikely on epidemiological grounds,[4] and frequent references in the medieval narrative sources may refer to numerous epidemics of more or less localized character. Similarly, evidential biases in the sources may magnify the apparent importance of certain, especially urban crises at the expense of frequent local epidemics which were less spectacular but cumulatively more significant in terms of national mortality. Both the medieval and early-modern periods experienced crisis mortality, however, and the present state of knowledge does not justify the conclusion that this was more severe in the fifteenth century than in the sixteenth.

The evidence necessary to substantiate medievalists' assertions of plague's importance in the later middle ages would have to indicate, for a high density of separate localities throughout the countryside, both crises which were synchronized over large geographical areas and also crises which were more frequent and more severe than for English parishes in the sixteenth century. Such evidence may not be forthcoming from a period before parish registers were established, but large-scale collations of local sources such as manor court records, which provide data for tenant death fluctuations, have not yet been attempted. One recent study may indicate another likely area for further work, and incidentally also demonstrates the lack of comparative knowledge which undermines current literature on the subject. This study compiled nearly twenty thousand wills registered in one region of England between 1430 and 1480, and examined temporal fluctuations and their geographical distribution in the surviving series of testators' deaths. Of several hundred parishes covered by these testamentary data, about fifteen percent exhibited at least one "crisis" quarter-year, and a handful as many as ten "crisis" quarters. Moreover, the great majority of these "crises" do not correspond to any known larger-scale epidemic. The author argued that this constitutes a strong indication of "endemic" plague. There are some statistical problems involved in the dataset, which is at any rate not completely comparable with parish-register data. But even if the figures are taken at face value, this incidence of crisis mortality is moderate when compared with what might be expected from a cursory inspection of burial rates from English parishes in the Tudor and Stuart periods.[5]

[4]The crises of 1361, 1369, and 1375, if they were purely bubonic plague epidemics, may be exceptions, as corroborating evidence for these years is particularly widespread [21].

[5]In this study a "crisis" quarter-year was isolated for any parish whose total of surviving wills reached three times the mean total for all parishes in the sample for that quarter-year [16]. No information is given for the average numbers which this might entail, so the statistical significance of this measure is unknown. In recent large-scale aggregations of English parish-register data from the sixteenth and seventeenth centuries, measures of crisis mortality based on *annual* burial totals compared with long moving averages have indicated that regular mortality fluctuations were much more severe than the medieval testamentary data would imply [2,23].

This comparison emphasizes the point that historical periods of frequent crisis mortality have not invariably been associated with high general mortality rates or restricted population growth, since the outstanding demographic difference between the fifteenth and sixteenth centuries is that English population was rising by as much as one percent per annum by the later 1500s but apparently stagnant little more than a century earlier. The need to explain this depression, and especially its social and economic consequences, has probably contributed most to medieval historians' ascriptions to plague mortality of the role of crucial independent variable in later-medieval demography. But this paper has argued that the differences in plague mortality incidence which have been described between the two centuries may be less a product of any medieval empirical foundation than a function of a particular set of demographic expectations invoked by medieval historians, which themselves appear at odds with a longer perspective of English population history.

Although this discussion has been concerned mainly with plague mortality incidence, it is necessary to point out that the expectations that long-term fertility rates would necessarily have tended to rise abruptly after the Black Death, and more generally that preindustrial populations will always tend to expand unless an exogenous force constrains growth, are inconsistent with recent research in early-modern historical demography. In preindustrial western Europe, linkage between fertility and economy operated primarily through adjustments in mean age at first marriage for women and in proportions of population married, in response to economic opportunities for new family formation. This linkage was complex and related to specific economic and social regimes, and fundamental change was gradual, but adjustments of this sort played an important part in another demographic depression which England experienced in the later seventeenth century [2, 24–26]. For the later middle ages, much firmer empirical work is necessary on the redistribution of agrarian resources freed by the Black Death and its specific effects on rural household economy and marriage structures before the linkage can be specified; in the meantime, simplistic assumptions about crude ratios of land to people are inadequate. Many aspects of the demographic history of medieval England are obscure, but writers on the subject must adopt a more comparative perspective if the problems are to be resolved.

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